

CLAIMS

1. A nonwoven fabric comprising at least two separate but interconnected layers, each of the layers being provided with discrete interconnections so as to provide discrete voids between the two layers of fabric.
2. A nonwoven fabric according to claim 1 characterised in that the voids comprise a channel within the structure of the fabric
- 10 3. A nonwoven fabric according to claim 1 characterised in that the voids comprise a plurality of channels.
4. A nonwoven fabric according to claim 2 characterised in that the channels are a substantially cylindrical or tubular shape.
- 15 5. A nonwoven fabric according to claim 1 characterised in that the voids are arranged in a substantially uniform or periodic manner.
6. A nonwoven fabric according to claim 1 characterised in that the thickness of the nonwoven of from 1 mm to 9 mm.
- 20 7. A nonwoven fabric according to claim 1 characterised in that the area density of the nonwoven fabric is from 40 to 300 g/m².
- 25 8. A nonwoven fabric as hereinbefore described wherein the voids comprise discrete channels within the body of the fabric.
9. A nonwoven fabric according to claim 1 characterised in that the fabric weight may be in the range 20-1000 g/m².

10. A nonwoven fabric according to claim 2 characterised in that the width of the channels are in the range from 0.2 mm to 8.5 mm

11. A nonwoven fabric according to claim 1 characterised in that the voids 5 contain within them functional materials.

12. A nonwoven fabric according to claim 11 characterised in that the functional material is a yarn, filament, wire, wax, gel, liquid, pulp or particle.

10 13. A nonwoven fabric according to claim 1 in which the separated layers are formed from carded, air-laid, wet-laid, spun-laid and meltblowns webs or combinations thereof.

15 14. A nonwoven fabric according to claim 1 in which at least two fibrous layers are made of different fibre types.

15. A nonwoven fabric according to claim 14 in which two fibrous layers comprises a hydrophobic and a hydrophilic layer respectively.

20 16. A nonwoven fabric according to claim 12 characterised in that the yarns or filaments are made of natural, man-made and/or mineral fibres.

25 17. A nonwoven fabric according to claim 12 characterised in that the liquids are cleaning liquids, detergent liquids, paints, perfumes, cosmetics, lotions, ointments, liquid nutrients or creams.

18. A nonwoven fabric according to claim 12 characterised in that the powders are selected from superabsorbents, cleaning agents or medicaments.

30 19. A nonwoven fabric according to claim 12 characterised in that the particles are selected from a material called Silica gel activated carbon particles, metallic

particles, ceramic particles, polymer particles, phase change material (PCM) particles or seed particles.

20. A nonwoven fabric according to claim 12 characterised in that the wires are
5 selected from electrically conductive wires, shape memory alloy (SMA) wire or optical wires.

21. A nonwoven fabric according to claim 12 characterised in that the gels are selected from hydrogels, medicinal gels or hygienic cleaning gels.

10 22. A method of manufacturing a nonwoven fabric as hereinbefore described which comprises the steps of;

15 (i) forming a nonwoven fabric from fibre or filament webs either side of a spacer device; and
(ii) causing fibres in at least one web to be transferred between the gaps in the spacer device towards the adjacent web (optionally applying the same process to the reverse side of the fabric) to form an integrated structure.

20 23. A method according to claim 22 in which high pressure water jets are used in combination with a rigid spacer device to manufacture the fabric.

25 24. A method according to claim 22 in which the web is formed by a method selected from, carding, carding and lapping, air-laid, melt-blown or spunlaid methods.

25. A method according to claim 22 in which two or more fibrous layers introduced on to the face and back surfaces of a spacer device.

26. A method according to claim 25 in which the layers are then conveyed along the upper and lower surfaces of the spacer device and at the same time are impacted by high pressure water jets, which interconnect groups of fibres in the layers between the spacer elements.

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27. A method according to claim 22 in which the fibres are mechanically entangled by the jets to provide structural cohesion in the fabric.

28. A method according to claim 22 in which a functional material is introduced 10 to the channel-like voids during the process.

29. A method according to claim 22 in which if the channel-like voids are filled with functional components, they are protected from the water jets during the bonding stage

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30. A method according to claim 22 in which at the end of the process, the formed fabric is removed from the spacer system to leave a 3D fabric structure.

31. A method according to claim 22 which is continuous.

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32. A method according to claim 22 in which the fabric is additionally thermally bonded.

33. A nonwoven fabric according to claim 1 characterised in that the nonwoven 25 fabric is suitable for the controlled release of one or more medicaments.

34. A nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is suitable for containing and/or delivering one or more cleaning fluids.

30 35. A nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is in the form of an absorbent article.

36. A nonwoven fabric according to claim 35 characterised in that the absorbent article is a wipe.

5 37. A nonwoven fabric according to claim 35 characterised in that the absorbent article is a wound dressing.

38. A nonwoven fabric according to claim 35 characterised in that the absorbent article is a baby diaper component.

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39. A nonwoven fabric according to claim 352 characterised in that the absorbent article is an incontinence pad.

15 40. A nonwoven fabric according to claim 35 characterised in that the absorbent article is a feminine hygiene absorbent pad.

41. A nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is suitable for light-weight thermal insulation.

20 42. The use of a nonwoven fabric according to claim 1 in the manufacture of an article.

25 43. The use according to claim 42 characterised in that the article is selected from the group, medicament delivery device, a cleaning fluids delivery device, an absorbent article, a wipe, a wound dressing, a baby diaper component, an incontinence pad, a feminine hygiene absorbent pad and a thermal insulation material.

30 44. A method of delivering a functional material which comprises the use of a nonwoven fabric according to claim 1

45. A device for manufacturing nonwoven fabric according to claim 1 wherein the device is substantially as described with reference to the accompanying examples and drawings.

5 46. A nonwoven fabric substantially as described with reference to the accompanying examples and drawings.

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